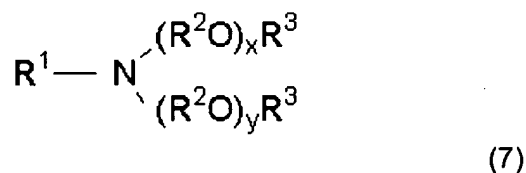


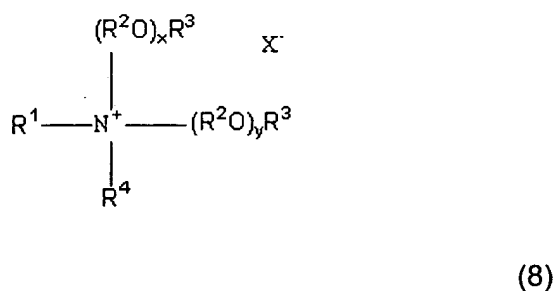
WHAT IS CLAIMED IS:

1. A cationic surfactant composition for use in an aqueous pesticidal formulation comprising a first surfactant selected from the group consisting of:

(a) dialkoxylated amines or quaternary ammonium salts having the formulae:

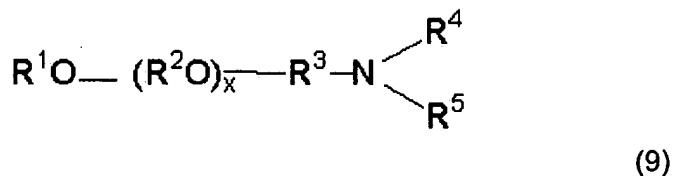


or

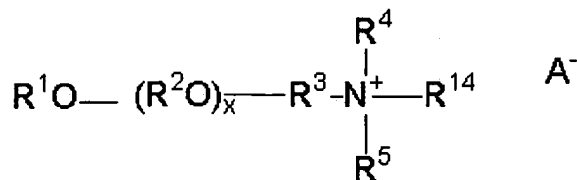


wherein R^1 and R^4 are independently hydrogen or hydrocarbyl or substituted hydrocarbyl having from 1 to about 30 carbon atoms, $-\text{R}^5\text{SR}^6$, or $-(\text{R}^2\text{O})_z\text{R}^3$, R^2 in each of the x (R^2O) , y (R^2O) and z (R^2O) groups is independently C_2 - C_4 alkylene, R^3 is hydrogen, or a linear or branched alkyl group having from 1 to about 22 carbon atoms, R^5 is a linear or branched alkyl group having from about 6 to about 30 carbon atoms, R^6 is a linear or branched alkyl group having from about 4 to about 15 carbon atoms, x , y and z are independently an average number from 1 to about 40, and X^- is an agriculturally acceptable anion.;

(b) aminated alkoxyated alcohol having the formula:



or



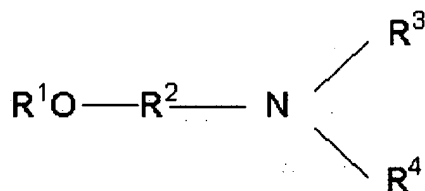
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(10)

wherein R¹ is hydrogen or hydrocarbyl or substituted hydrocarbyl having from 1 to about 30 carbon atoms; R² in each of the x (R²O) and y (R²O) groups is independently C₂-C₄ alkylene; R³ and R⁶ are each independently hydrocarbylene or substituted hydrocarbylene having from 1 to about 6 carbon atoms; R⁴ is hydrogen, hydrocarbyl or substituted hydrocarbyl having from 1 to about 30 carbon atoms, hydroxy substituted hydrocarbyl, -(R⁶)_n-(R²O)_yR⁷, -C(=NR¹¹)NR¹²R¹³, -C(=O)NR¹²R¹³, or -C(=S)NR¹²R¹³; R⁵ is -(R⁶)_n-(R²O)_yR⁷; R⁷ is hydrogen or a linear or branched alkyl group having 1 to about 4 carbon atoms; R¹¹, R¹² and R¹³ are hydrogen, hydrocarbyl or substituted hydrocarbyl, R¹⁴ is hydrogen, hydrocarbyl or substituted hydrocarbyl having from 1 to about 30 carbon atoms, hydroxy substituted hydrocarbyl, -(R⁶)_n-(R²O)_yR⁷, -C(=NR¹¹)NR¹²R¹³, -C(=O)NR¹²R¹³, or -C(=S)NR¹²R¹³, n is 0 or 1, x and y are independently an average number from 1 to about 60, and A⁻ is an agriculturally acceptable anion;

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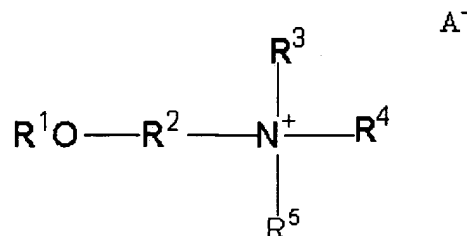
(c) etheramines or ether quaternary ammonium salts having the formula:



25

(5)

or



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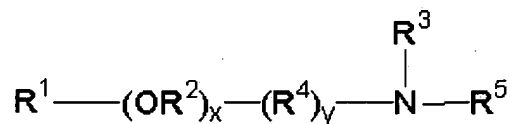
(11)

wherein R¹ is hydrogen or a hydrocarbyl or substituted hydrocarbyl having from 1 to about 30 carbon atoms; R² is hydrocarbylene or substituted hydrocarbylene having from 2 to about 30 carbon atoms; R³, R⁴ and R⁵ are independently hydrogen, hydrocarbyl or substituted hydrocarbyl having from 1 to about 30 carbon atoms, or -(R⁶O)_xR⁷, R⁶ in each of the x(R⁶O) groups is independently C₂-C₄ alkylene, R⁷ is hydrogen, or a linear or branched alkyl group having from 1 to about 4 carbon atoms, x is an average number from 1 to about 50, and A⁻ is an agriculturally acceptable anion;

10

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(d) alkoxyated poly(hydroxyalkyl)amines having the formula:

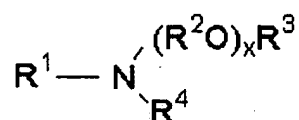


(14)

wherein R¹ and R³ are independently hydrogen, hydrocarbyl or substituted hydrocarbyl having from 1 to about 30 carbon atoms, R² in each of the x (R²O) groups is independently C₂-C₄ alkylene; R⁴ is hydrocarbylene or substituted hydrocarbylene having from 1 to about 30 carbon atoms, R⁵ is hydroxyalkyl, polyhydroxyalkyl, or poly(hydroxyalkyl)alkyl; x is an average number from 0 to about 30, and y is 0 or 1;

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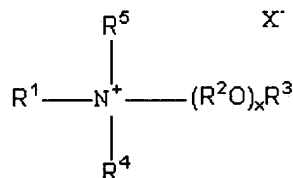
(e) monoalkoxylated amines having the formula:



(15)

- wherein R^1 and R^4 are independently hydrocarbyl or substituted hydrocarbyl groups having from 1 to about 30 carbon atoms or $-R^5SR^6$, R^2 in each of the x (R^2O) groups is independently C_2-C_4 alkylene, R^3 is hydrogen, or a linear or branched alkyl group having from 1 to about 4 carbon atoms, R^5 is a linear or branched alkyl group having from about 6 to about 30 carbon atoms, R^6 is a hydrocarbyl or substituted hydrocarbyl group having from 4 to about 15 carbon atoms and x is an average number from 1 to about 60;

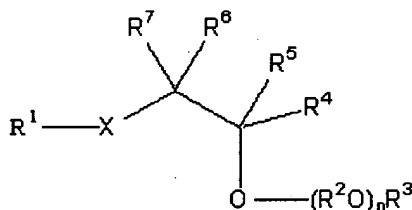
(f) monoalkoxylated quaternary ammonium salts having the formula:



(16)

- wherein R^1 and R^5 are independently hydrogen or hydrocarbyl or substituted hydrocarbyl having from 1 to about 30 carbon atoms, R^4 is hydrocarbyl or substituted hydrocarbyl having from 1 to about 30 carbon atoms, R^2 in each of the x (R^2O) groups is independently C_2-C_4 alkylene, R^3 is hydrogen, or a linear or branched alkyl group having from 1 to about 30 carbon atoms, x is an average number from 1 to about 60, and X^- is an agriculturally acceptable anion; and

(g) an amine having the formula:



(17)

Figure 6

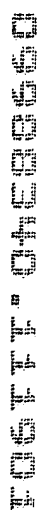


Figure 6

Figure 6

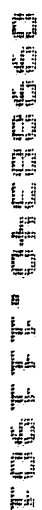
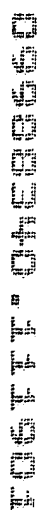
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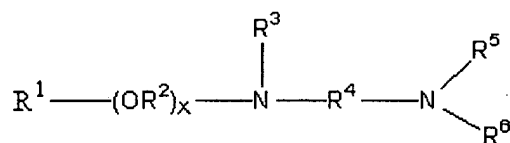
Figure 6

[illegible][illegible][illegible]

independently hydrogen, hydrocarbyl or substituted hydrocarbyl having from 1 to about 30 carbon atoms, or R^4 ; R^{14} is hydrogen, hydrocarbyl or substituted hydrocarbyl having from 1 to about 30 carbon atoms, or $-(CH_2)_zO(R^2O)_pR^3$; m, n, p and q are independently an average number from 1 to about 50; X is $-O-$, $-N(R^{14})-$, $-C(O)-$, $-C(O)O-$, $-OC(O)-$, $-N(R^{15})C(O)-$, $-C(O)N(R^{15})-$, $-S-$, $-SO-$, or $-SO_2-$; t is 0 or 1; A- is an agriculturally acceptable anion; and y and z are independently an integer from 0 to about 30; and

a second surfactant selected from the group consisting of:

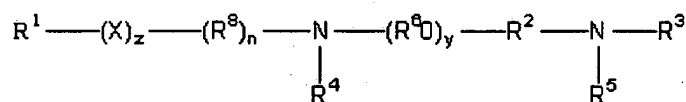
(a) alkoxyated diamines having the formula:



(21)

wherein R^1 is hydrocarbyl or substituted hydrocarbyl having from about 8 to about 30 carbon atoms; R^2 in each of the x (R^2O) groups and the y (R^2O) groups is independently C_2-C_4 alkylene; R^3 , R^5 and R^6 are independently hydrogen, hydrocarbyl or substituted hydrocarbyl having from 1 to about 30 carbon atoms, or $-(R^2O)_yR^7$; R^4 is hydrocarbylene or substituted hydrocarbylene having from 2 to about 6 carbon atoms, $-C(=NR^{11})NR^{12}R^{13}-$, $-C(=O)NR^{12}R^{13}-$, $-C(=S)NR^{12}R^{13}-$, $-C(=NR^{12})-$, $-C(S)-$, or $-C(O)-$; R^7 is hydrogen, or a linear or branched alkyl group having from 1 to about 4 carbon atoms; R^{11} , R^{12} and R^{13} are hydrogen, hydrocarbyl or substituted hydrocarbyl having from 1 to about 30 carbon atoms, x is 0 or an average number from 1 to about 30; and y is an average number from 1 to about 50;

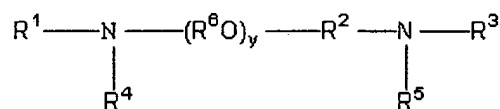
(b) diamines having the formula:



(6)

wherein R^1 , R^3 , R^4 and R^5 are independently hydrogen, hydrocarbyl or substituted hydrocarbyl having from 1 to about 30 carbon atoms, or $-(R^6O)_xR^7$; R^2 and R^8 are independently hydrocarbylene or substituted hydrocarbylene having from 2 to about 30 carbon atoms, R^6 in each of the x (R^6O) and y (R^6O) groups is independently C_2 - C_4 alkylene, R^7 is hydrogen, or a linear or branched alkyl group having from 1 to about 30 carbon atoms, x is an average number from 1 to about 30, X is $-O-$, $-N(R^6)-$, $-C(O)-$, $-C(O)O-$, $-OC(O)-$, $-N(R^9)C(O)-$, $-C(O)N(R^9)-$, $-S-$, $-SO-$, or $-SO_2-$, y is 0 or an average number from 1 to about 30, n and z are independently 0 or 1, and R^9 is hydrogen or hydrocarbyl or substituted hydrocarbyl;

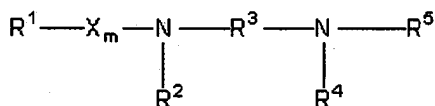
(c) diamines having the formula:



(22)

wherein R^1 , R^3 , R^4 and R^5 are independently hydrogen, hydrocarbyl or substituted hydrocarbyl having from 1 to about 30 carbon atoms, or $-(R^6O)_xR^7$, R^2 is hydrocarbylene or substituted hydrocarbylene having from 2 to about 30 carbon atoms, R^6 in each of the x (R^6O) and y (R^6O) groups is independently C_2 - C_4 alkylene, R^7 is hydrogen, or a linear or branched alkyl group having from 1 to about 30 carbon atoms, x is an average number from 1 to about 30, and y is an average number from about 3 to about 60;

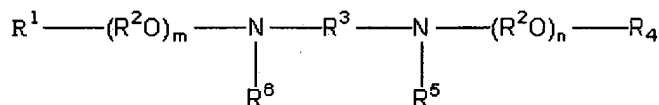
(d) diamines having the formula:



(23)

wherein R^1 , R^2 and R^5 are independently hydrogen or hydrocarbyl or substituted hydrocarbyl having from 1 to about 30 carbon atoms or $-R^8(OR^9)_nOR^{10}$, R^3 is hydrocarbylene or substituted hydrocarbylene having from 2 to about 18 carbon atoms, R^8 and R^9 are individually hydrocarbylene or substituted hydrocarbylene having from 2 to about 4 carbon atoms, R^4 and R^{10} are independently hydrogen or hydrocarbyl or substituted hydrocarbyl having from 1 to about 30 carbon atoms, m is 0 or 1, n is an average number from 0 to about 40, X is $-C(O)-$ or $-SO_2-$, and A^- is an agriculturally acceptable anion;

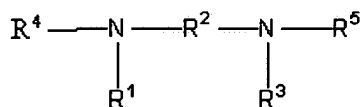
(e) diamines having the formula:



(24)

[wherein R^1 , R^4 , R^5 and R^6 are independently hydrogen or hydrocarbyl or substituted hydrocarbyl having from 1 to about 30 carbon atoms, R^2 in each of the m (R^2O) and n (R^2O) groups and R^7 are independently C_2-C_4 alkylene, R^3 is hydrocarbylene or substituted hydrocarbylene having from about 2 to about 6 carbon atoms or $-(R^2O)_pR^7-$, m and n are individually an average number from 0 to about 50, and p is an average number from 0 to about 60;

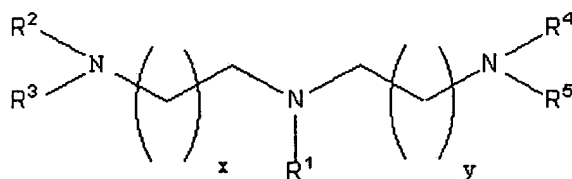
(f) di-poly(hydroxyalkyl)amines having the formula:



(25)

wherein R^1 and R^3 are independently hydrogen or hydrocarbyl or substituted hydrocarbyl having from 1 to about 22 carbon atoms, R^2 is hydrocarbylene or substituted hydrocarbylene having from 2 to about 18 carbon atoms, R^4 and R^5 are independently hydroxyalkyl, polyhydroxyalkyl, or poly(hydroxyalkyl)alkyl; and

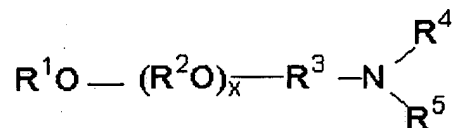
(g) alkoxyated triamines having the formula:



(27)

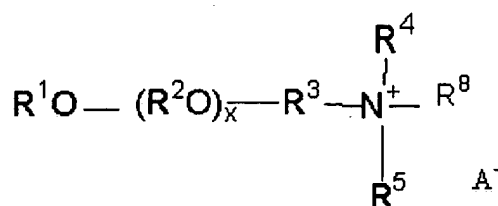
wherein R¹ is hydrocarbyl or substituted hydrocarbyl having from 1 to about 30 carbon atoms; R², R³, R⁴ and R⁵ are independently hydrogen, hydrocarbyl or substituted hydrocarbyl having from 1 to about 30 carbon atoms, or -(R⁶)_s(R⁷O)_nR⁶; R⁶ is hydrogen or a linear or branched alkyl group having from 1 to about 4 carbon atoms, R⁷ in each of the n (R⁷O) groups is independently C₂-C₄ alkylene; R⁸ is hydrocarbylene or substituted hydrocarbylene having from 1 to about 6 carbon atoms, n is an average number from 1 to about 10, s is 0 or 1, and x and y are independently an integer from 1 to about 4.

2. A surfactant composition of claim 1 wherein said surfactant of formula (d) is a monoalkoxylated amine or quaternary amine having the formulae:



(12)

or



(13)

wherein R¹ is hydrogen or hydrocarbyl or substituted hydrocarbyl having from 1 to about 30 carbon atoms; R² in each of the x (R²O) and y (R²O) groups is independently C₂-C₄ alkylene; R³ is hydrocarbylene or substituted hydrocarbylene having from 2 to about 30 carbon atoms; R⁴, R⁵ and R⁸ are each independently hydrogen, hydrocarbyl or substituted hydrocarbyl having from 1 to about 30 carbon atoms, -(R⁶)_n-(R²O)_yR⁷, or R⁴ and R⁵, together with the nitrogen atom to which they are attached, form a cyclic or heterocyclic ring; R⁶ is hydrocarbylene or substituted hydrocarbylene having from 1 to about 30 carbon atoms; R⁷ is hydrogen or a linear or branched alkyl group having 1 to about 4 carbon atoms, n is 0 or 1, x and y are independently an average number from 1 to about 60, and A⁻ is an agriculturally acceptable anion.

3. A pesticidal composition comprising

(a) at least one pesticide; and

(b) an agriculturally useful amount of the surfactant composition of claim 1.

4. A composition of claim 3 wherein the pesticide comprises a herbicide.

5. A composition of claim 4 wherein the herbicide comprises glyphosate or a salt or ester thereof.

6. A composition of claim 5 wherein the glyphosate is predominantly in the form of the potassium, monoammonium, diammonium, sodium, monoethanolamine, n-propylamine, isopropylamine, ethylamine, ethylenediamine, hexamethylenediamine or trimethylsulfonium salt thereof.

5 8. A composition of claim 1 wherein said composition is a concentrate.

(b) an agriculturally useful amount of the surfactant composition of claim 1.

10 11. An aqueous herbicidal composition comprising

15 12. A composition of claim 11 wherein said composition is a concentrate.

14. An aqueous herbicidal concentrate composition comprising:
glyphosate predominantly in the form of the potassium, monoammonium,
diammonium, sodium, monoethanolamine, n-propylamine, ethylamine,
ethylenediamine, hexamethylenediamine or trimethylsulfonium salt thereof, in
solution in an aqueous medium in an amount of in excess of 300 grams acid
equivalent per liter of the composition; and

from about 20 to about 300 grams per liter of the surfactant composition of claim 1.

SECRET

25 The composition of Claim 24, wherein the composition has a viscosity of less than about 225 centipoise at 0°C at 45/s shear rate.

SECRET

26. The composition of claim 14 wherein said surfactant composition is selected such that the herbicidal concentrate composition exhibits no crystallization of said glyphosate or salt thereof when stored at a temperature of about 0°C for a period of about 7 days.

5 27. The composition of claim 26 wherein said surfactant composition is selected such that the herbicidal concentrate composition exhibits no crystallization of said glyphosate or salt thereof when stored at a temperature of about -10°C for a period of about 7 days.

10 28. The composition of claim 14 wherein said glyphosate, predominantly in the form of the potassium salt thereof, is in solution in said medium in an amount of about 310 to about 600 grams of acid equivalent per liter of the composition.

 29. The composition of claim 28 wherein said glyphosate, predominantly in the form of the potassium salt thereof, is in solution in said medium in an amount of about 360 to about 600 grams of acid equivalent per liter of the composition.

15 30. The composition of claim 29 wherein said glyphosate, predominantly in the form of the potassium salt thereof, is in solution in said medium in an amount of about 400 to about 600 grams of acid equivalent per liter of the composition.

20 31. The composition of claim 30 wherein the concentration of said glyphosate is from about 450 to about 600 grams of acid equivalent per liter of the composition.

 32. The composition of claim 30 wherein the concentration of said glyphosate is from about 500 to about 600 grams of acid equivalent per liter of the composition.

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33. The composition of claim 31 wherein the concentration of said glyphosate is from about 480 to about 600 grams of acid equivalent per liter of the composition.

34. The composition of claim 30 wherein the concentration of said
5 glyphosate is from about 480 to about 580 grams of acid equivalent per liter of the
composition.

35. The composition of claim 31 wherein the concentration of said glyphosate is from about 540 to about 600 grams of acid equivalent per liter of the composition.

10 36. The composition of claim 14 wherein the total amount of surfactant is
from about 60 to about 240 grams per liter of the herbicidal concentrate composition.

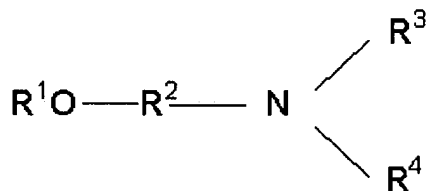
37. The composition of claim 36 wherein the total amount of surfactant is from about 60 to about 200 grams per liter of the herbicidal concentrate composition.

38. The composition of claim 14, wherein the composition is substantially
15 homogeneous upon storage at 50°C for one week.

39. A composition of claim 14 wherein the composition has a density of at least about 1.210 grams/liter.

40. A composition of claim 14 wherein the surfactant composition comprised
20 by the herbicidal concentrate composition is not substantially antagonistic to the
herbicidal activity of the glyphosate.

41. A cationic surfactant composition for use in an aqueous pesticidal formulation comprising at least one etheramine having the formula:

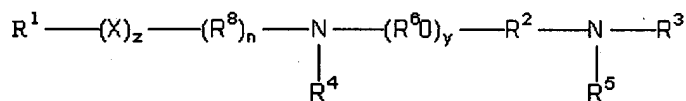


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(5)

wherein R¹ is hydrogen or a hydrocarbyl or substituted hydrocarbyl having from 1 to about 30 carbon atoms; R² is hydrocarbylene or substituted hydrocarbylene having from 2 to about 30 carbon atoms; R³ and R⁴ are independently hydrogen, hydrocarbyl or substituted hydrocarbyl having from 1 to about 30 carbon atoms, or -(R⁵O)_xR⁶, R⁵ in each of the x(R⁵O) groups is independently C₂-C₄ alkylene, R⁶ is hydrogen, or a linear or branched alkyl group having from 1 to about 4 carbon atoms, x is an average number from 1 to about 50, and A⁻ is an agriculturally acceptable anion; and

at least one diamine having the formula:



(6)

wherein R¹, R³, R⁴ and R⁵ are independently hydrogen, hydrocarbyl or substituted hydrocarbyl having from 1 to about 30 carbon atoms, or -(R⁶O)_xR⁷; R² and R⁸ are independently hydrocarbylene or substituted hydrocarbylene having from 2 to about 30 carbon atoms, R⁶ in each of the x (R⁶O) and y (R⁶O) groups is independently C₂-C₄ alkylene, R⁷ is hydrogen, or a linear or branched alkyl group having from 1 to about 30 carbon atoms, x is an average number from 1 to about 30, X is -O-, -N(R⁶)-, -C(O)-, -C(O)O-, -OC(O)-, -N(R⁹)C(O)-, -C(O)N(R⁹)-, -S-, -SO-, or -SO₂-, y is

0 or an average number from 1 to about 30, n and z are independently 0 or 1, and R⁹ is hydrogen or hydrocarbyl or substituted hydrocarbyl.

42. A pesticidal composition comprising

5

(a) at least one pesticide; and

(b) an agriculturally useful amount of the surfactant composition of claim 1.

43. A composition of claim 42 wherein the pesticide comprises a herbicide.

44. A composition of claim 43 wherein the herbicide comprises glyphosate or a salt or ester thereof.

10

45. A composition of claim 44 wherein the glyphosate is predominantly in the form of the potassium, monoammonium, diammonium, sodium, monoethanolamine, n-propylamine, isopropylamine, ethylamine, ethylenediamine, hexamethylenediamine or trimethylsulfonium salt thereof.

15

46. A composition of claim 45 wherein the glyphosate is predominantly in the form of the potassium, monoammonium, diammonium, sodium, monoethanolamine, n-propylamine, ethylamine, ethylenediamine, hexamethylenediamine or trimethylsulfonium salt thereof.

47. A composition of claim 41 wherein said composition is a concentrate.

20

48. An aqueous herbicidal composition comprising:

glyphosate or a salt or ester thereof; and

an agriculturally useful amount of the surfactant composition of claim 41.

49. A composition of claim 41 wherein said composition is a concentrate.

5

52. A herbicidal method comprising diluting in a suitable volume of water a herbicidally effective amount of a composition of claim 14-to form an application mixture, and applying the application mixture to foliage of a plant.

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